into the rectum and filled with ice-water, would answer better for stopping hemorrhage from the rectum than a pig's bladder; though I have already called attention to the advantages of a thorough exploration of the rectum with Sims' speculum to aid in stopping hemorrhage from this part. I can see no reason why the rubber capote, properly fitted to a suitable tube, may not be used in dilating a stricture of the œsophagus. I suggest, incidentally, this manner of treating stricture of the œsophagus as worthy of a trial.

To return to our subject, an anti-syphilitic treatment of stricture of the rectum is worse than useless. This treatment does harm by increasing the debility of the patient. When the stricture is fibrous, as in the typical case which I have reported in this article, it should be very thoroughly divided with the knife or scissors, and kept properly dilated. There should also be made to the diseased mucous membrane above the stricture suitable applications, such as the chloride of zinc or carbolic acid sufficiently diluted.

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ART. X.—*On Immunity from the Action of Morbific Agents.*

By D. FRANCIS CONDIE, M. D., of Philadelphia.

A CAREFUL study of the human organism during a state of health will, we think, convince every one that it is endowed with an inherent power which enables it to resist the action of all such agents as are capable of disturbing the regular performance of its several functions. Although this conservative power has, it is true, from divers causes, become to a considerable extent impaired, we, nevertheless, in every community meet with individuals who enjoy in a very great degree an immunity from the action of morbific agents generally, to the influence of which all the other members of the community are alike susceptible.

The fact just stated was recognized by the leading medical authorities of an early date, though it has been in a great measure overlooked by those of a later period. Still, every observing physician, conversant with the diseases of malarious and otherwise unhealthy localities, where every portion of the population is equally exposed to the same unwholesome atmosphere, is aware that many of the inhabitants of such localities live, even to an advanced age, in the enjoyment of a good degree of health; escaping entirely an attack of the diseases which prevail there endemically.

The same thing is true in respect to nearly all zymotic diseases. During their prevalence, some members of the community, without adopting any special precautionary measures, escape an attack.

The almost entire exemption of the negro from yellow fever in places to which the disease is indigenous, is a well-established fact. To the attack even of diseases which are recognized as being among those possessed of the most marked contagious character, some persons enjoy an entire immunity, no matter how complete their exposure. Thus, we have known an individual, employed as a nurse in one of the wards of a hospital devoted to the treatment of chronic diseases of the skin, and whose duty it was to wash and anoint, twice every day, patients affected with psora, in its most virulent form, and yet to escape entirely infection, with no other precaution being taken by him than simple ablution of his hands with soap and water each time his task was completed.

There are individuals who enjoy a similar immunity from the poisonous effects which result from contact with the juices of or the emanations from certain noxious plants, which can never come in contact with the skin of other persons without producing more or less intense inflammation of an erysipelatous character. We have known persons who could handle with perfect impunity the poison vine (*rhus radicans*) as well indeed as any of the other species of poisonous sumach, while others, again, dared not approach within a few feet to the windward of the plant without experiencing its poisonous effects.

That the cases in which immunity from the action of morbific agents, to which reference has been made, are not to be received as instances of merely accidental or casual exemption from the influence of prevailing health disturbing agencies, is proved by the fact that similar immunity is manifested in all subsequent instances of similar exposure.

It is true that, occasionally, we meet with cases in which the resistance to morbific influences was, at first complete, but which became, after repeated exposure to such influences, at short intervals, or even, sometimes, as it would seem, simply with the lapse of time, more or less impaired, if not entirely lost.

In not a few instances the immunity from an attack of endemic or epidemic disease is manifested even in cases where the morbific matter is introduced into the system by direct inoculation. In our note-book several cases are recorded, in which primary vaccination was performed, with pure, recent, active matter; but without the operation being followed by any other result than a slight soreness at the part where the virus was introduced, and which was entirely gone in a day or two. The same thing occurred after a second and third insertion of vaccine matter, that had been used successfully in other cases; finally, inoculation with variolous matter was resorted to, and with the same negative result. In three of these cases the patients, after the lapse of six, eight, and fourteen years respectively, were exposed to variolous infection during severe epidemics of smallpox, and all contracted the disease, but in a very mild and greatly modified form.

The fact that such resistance to the action of morbific agents is possessed, to a greater or less degree, by certain individuals, must not be lost sight of in making up our estimate of the extent and value of the protection against variolous disease afforded by vaccination. Among every given number of persons who have been vaccinated, apparently with complete success, there will always be found some, and the average number will amount perhaps to some sixty-seven per cent., who will be endowed with complete and permanent protection from an attack of smallpox, even in a mild and modified form; others, in whom the protection, will be for a time complete, and continue so for a longer or shorter period in different cases, when the protection will become gradually more or less impaired, and finally fail entirely; while, in other cases, there will be, at all times, when exposure to the infection of variola takes place, a liability to an attack of the latter though in nearly every instance in a decidedly modified form—mild in its symptoms, short in its duration, and terminating neither in deformity nor in death.

Excepting in those cases, which, however, are of rare occurrence, where pure vaccine matter, recent and active, is employed, and where the operation is followed by neither constitutional nor local effect, it is impossible to judge, with anything like an approach towards certainty, the extent to which, and the period of time during which a vaccinated subject will enjoy exemption from variolous infection; the extent and endurance of the exemption having no direct relation to the character and course of the local phenomena, which follow the insertion into the arm of vaccine virus.

If now we are correct in our premises, which are based upon a very large series of careful observations of our own and of a host of other practitioners in this country and in Europe, the importance, nay, the absolute necessity of revaccination in all cases, to insure the complete prophylaxis furnished by the vaccine infection, against smallpox, is rendered apparent.

When smallpox occurs in the midst of a community of the vaccinated who are exposed to its infection there will always be some who are liable to an attack of the disease, which will be in nearly every instance more or less modified in its leading features—in its duration, in its severity, in its sequelæ, and in its mortality—in different cases; but which, even in this modified form, will be capable of giving rise to an infection or contagion by which the disease may be propagated, and in its most malignant form, throughout a large portion of the community. Now, having no certain means of determining to what extent they who have been already subjected to vaccination are completely protected from the action of the variolous infection to which they are liable to be exposed at any moment, it must be evident that to insure them from an attack of smallpox, and thus prevent its spread beyond the original focus of contagion, it is necessary, with as little delay as possible, to subject the entire community to vaccination, even those members who are reputed to have already successfully undergone the operation those, also, in whom the operation has been repeated even three or more times. By this course in more than one locality in the interior of Pennsylvania the spread of smallpox among the indwellers, when introduced from without, has for several years past been promptly and effectually checked. In the same manner, the city of Providence, Rhode Island, has been completely protected from smallpox for the last fourteen years, as is shown by the annual reports of Dr. E. M. Snow, Superintendent of Health for that city.

In a large manufacturing establishment located within twenty-five miles of Philadelphia, one hundred and eighty hands, upon an average, are constantly employed, consisting of males and females in nearly equal proportion, and of individuals of different ages, from fifteen to sixty years; the great majority of the males being below forty-five years, and of the females below thirty. In this establishment the more or less frequent accession of new hands to supply vacancies produced by various causes, or to meet the increased demand for labourers, causes a frequently recurring liability to the introduction among the hands of smallpox. To guard against such an occurrence, the physician who has charge of the hands employed in this manufactory has, since the year 1859, subjected them all, indiscriminately, every twelve months, to revaccination. With the results of these revaccinations, in one hundred of the hands, including only such as had remained in the factory continuously for the preceding ten years, we have been furnished. They are as follows:—

The 1st year's revaccinations gave apparently regular results in 20 cases; partial results in 8 cases; no results in 71 cases.

" 2d year's gave 16 apparently regular results; in 6 partial results; no results in 78 cases.

" 3d year's gave 13 cases apparently regular; in 10 partial results; no results in 77 cases.

" 4th year's gave 8 cases apparently regular; in 6 partial results; no results in 86 cases.

" 5th year's gave 6 cases apparently regular; in 3 partial results; no results in 91 cases.

" 6th year's gave 5 cases apparently regular; in 2 partial results; no results in 93 cases.

" 7th year's gave 3 cases apparently regular; in two partial results; no results in 95 cases.

" 8th year's gave 3 cases apparently regular; in 2 partial results; no results in 95 cases.

" 9th year's gave 1 case apparently regular; in 2 partial results; no results in 97 cases.

" 10th year's gave *no* case apparently regular; *one* irregular; while in 99 cases there were no results.

No case of smallpox occurred among the hands in the factory during the ten years referred to, notwithstanding the prevalence of the disease on two different occasions within that time amid the community, of which these hands constituted a part.

The foregoing results of a series of revaccinations repeated annually for a period of ten years, are of a more interesting character than those based upon the ample series of revaccinations that have been for a long series of years practised among the soldiers of the standing armies of Prussia, Wurtemberg, and Bavaria, inasmuch as the subjects of the first series were the same throughout the entire period, while the latter series were performed on masses of men, to which new recruits were being constantly added every year.

In the foregoing paper we have taken for granted that, so far as our remarks bear upon the subject of vaccination, and the extent and duration of its efficiency as a protection against an attack of smallpox, the operation was in all cases skilfully performed, with genuine effective matter, while nothing occurred to interfere with its regular course. Our only object has been to show that the necessity for prompt and general vaccination and revaccination in every community into which smallpox has been or is in danger of being introduced, arises simply from the fact that amid every community there will be individuals insusceptible to that complete and permanent impression of the vaccine influence necessary to render it a full and enduring prophylaxis against an attack of smallpox; we have taken no account whatever of any of those accidental and avoidable causes by which vaccination is prevented from conferring upon its subjects a full and enduring protection from variolous infection; such as the use of spurious or effete matter, or when after a perfect vesicle has been formed it is early ruptured, thus causing a discharge of its contents; or by the production, by any means, of phlegmonous inflammation, and the formation of purulent matter in place of the generation of vaccine lymph, etc. etc.

We may remark, in conclusion, that among the hands in the manufactory where the revaccinations were performed, of the results of which we have given an account, the arms of several of both sexes who were of European birth, presented two, and even three well-marked vaccine cicatrices. Now in these it was found that only one per cent. of the revaccinations were followed by the slightest result.

ART. XI.—*Contribution to the Knowledge of the Physiological Action of Atropia.* No. 1. *Its influence on Pigeons.* By H. C. WOOD, Jr., M. D., Professor of Botany in the University of Pennsylvania.

ALTHOUGH there are very few drugs whose physiological action has been studied within the last fifteen years as closely as that of belladonna, yet